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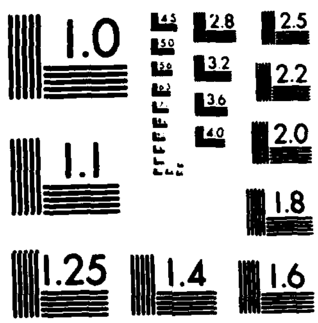

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FOREIGN TECHNOLOGY DIVISION

COMPOSITE COAXIAL TELECOMMUNICATIONS CABLE

by

Tadeusz Lapinski

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EDITED TRANSLATION

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By: Tadeusz Lapinski

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COMPOSITE COAXIAL TELECOMMUNICATIONS CABLE

Author: Tadeusz Łapiński

At the end of 1978 the Cable Factory im. M. Buczek in Ożarów in Masuria began the production of long-distance composite telecommunications cable with coaxial pairs and quads having expanded polyethylene insulation, developed by the ENERGOKABEL Research and Development Center.

The small-dimension type 1.2/4.4 coaxial pairs with insulation in the form of cyclically clamped polyethylene tubing are specified for the transmission of analog signals at frequencies up to 12.5 MHz (2700-channel telephone transmission) and up to 108 kHz, as well as for the transmission of digital signals up to 2 Mbit/sec.

This long-distance composite cable is used as a replacement for coaxial cable and symmetrical cable. Lines constructed using this cable are smaller than lines constructed with the two kinds of cable mentioned here.

Four kinds of composite cable profiles can be realized using this cable: with two, four, six, and eight pairs. One layer of quads numbering respectively for a 0.9 mm conductor 12, 14, 18, and 20, and for a 1.2 mm conductor, 10, 12, 14, and 16, is set up as the core for cables formed from coaxial pairs and three auxiliary bundles.

The structure of small-dimension coaxial pairs and their characteristics are in conformance with WT-78/K-094 Technical Specifications, and the structure

of the star quads according to WT-77/K-093.

A rippled aluminum shield, protected from corrosion by means of a bitumen covering and an extruded polyethylene jacket, is placed around the center of the cables.

The nominal value of the actual capacitance of side circuit quads is 38.5 nF/km. The results of measurements have shown that actual capacitance is included within the range 36.69 to 37.96 nF/km.

Average near-end crosstalk attenuation between side circuits within the quads of composite cable 500 m long at a frequency of 100 kHz is 74.31 dB. Between side circuits with adjacent quads 86.42 dB, between side circuits separated from each other by a single separating quad 97.86 dB, and separated from each other by two quads 106.79 dB.

The average far-end crosstalk attenuation between side circuits within the quads of composite cable 500 m long at a frequency of 100 kHz is 80.6 dB, between side circuits with adjacent quads 96.74 dB, between side circuits separated from each other by a single separating quad 98.95 dB, and separated from each other by two quads 112.89 dB.

Relationship between constituent wave impedance (W_0) and wave attenuation (a) in a symmetrical line, and frequency (f).

f	W_0	a
[illegible]	Ω	[illegible]
1	[illegible]	[illegible]
[illegible]	[illegible],91	1,[illegible]
10	[illegible],14	1,[illegible]
[illegible]	[illegible]	[illegible]
100	[illegible]	[illegible]
211	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

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